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# Integration of Control Systems: A Focus on Safety

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## Abstract

This abstract describes the importance of the design, integration and testing of control systems as a holistic structure in order to ensure process safety and operability.
As a byproduct of today's era of large projects, it is increasingly common in the design and integration of modern control systems that individual components of the control systems are developed independently as standalone elements. This current trend in development focuses less on the integration of the components as a holistic system- including process control, safety logic, packaged equipment control, and operator interactions. These components, though having independent primary functions, must synchronize harmoniously to operate a facility with reliability and safety. The downside of independent testing is that while the shutdown functions of a safety system might be adequately checked, the interaction with the process control system could cause unforeseen results, leading to the inability to start up a process unit in an acceptable timeframe or even at all.

Robust and standardized integrated testing of all components of a control system provides greater confidence in identifying potential operational or safety issues that could arise at commissioning or during operation, while allowing time to remedy with proper review and testing. Additionally, utilization of a process model or simulation can help to further strengthen confidence in the holistic system by simulating field devices to test logic in situ. Furthermore, this combined control system and process model can provide a higher level of operator training.